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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • MARCH 13, 1943

Scientists of Tomorrow

See Page 163

A SCIENCE SERVICE PUBLICATION

Do You Know?

Trihydroxypropane to the chemist is *glycerine* to us.

Colombia, South America, is one of the world's chief producers of *platinum*.

Canada's *tobacco* products are now made almost exclusively from Canadian-grown tobacco.

Eleven and a half billion yards of *cotton* rolled from the looms in America's mills during 1942.

The use of *platinum* in jewelry is prohibited by the government because the total available supply is needed in war.

Coffee substitutes and coffee blends may contain chicory, soybean, roasted barley, Mexican chick peas, roasted rye cereal, rolled wheat flour, molasses, or corn meal.

Plywood has come into its many new uses because of modern synthetic resin glues, and impregnating and densifying compounds, which make it practically a new product.

Beekeepers are asked by the governernment to expand their production of *bees* as more are needed to produce honey and wax, and to insure pollination of clovers and other legumes.

In three and one-half years *Atlantic Clippers* have made nearly 1,200 transatlantic crossings, carrying 45,000 passengers and 2,500,000 pounds of cargo.

Women *chemists* three years ago were largely in teaching and medical research; today large numbers are in the industries.

Scientists predict that *radio trails* will soon cross the continent like highways and aviators will see their way in three dimensions by radio vision.

The *peanut* contains more protein than beefsteak and half a small peanut holds all the extra calories needed for the energy demands of an hour of brain work.

Question Box

Page numbers of Questions discussed in this issue:

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

● RADIO

Saturday, March 20, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Norman H. Jolliffe, of New York University, will discuss "Vitamins in Treatment of Disease."

Monday, March 15, 9:15 a.m., EWT; 2:30 p.m., CWT; 9:30 a.m., MWT; and 1:30 p.m., PWT

Science at Work, School of the Air of the Americas over the Columbia Broadcasting System, presented in cooperation with the National Education Association, Science Service and Science Clubs of America.

"The Forces of Heredity" will be the subject of the program.

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GENERAL SCIENCE

Science Scholarships

Iowa girl and New York boy chosen for the $2,400 Westinghouse Grand Science Awards. Two girls and six boys given $400 each. Others get $100.

See Front Cover

➤ A PRETTY, petite blonde from the Midwestern prairies and a tall, studious youth from a New York City suburb were selected through the Second Annual Science Talent Search, as winners of the two top honors scholarships worth $2,400 each, to carry them through any college of their choice in the nation. They are pictured on the front cover of this week's SCIENCE NEWS LETTER.

The top scholarship winners are Miss Gloria I. Lauer, 17, of Ames, Iowa, and Ray R. Schiff, 16, of New Rochelle, N. Y. They were selected from among 40 top-ranking high school seniors who were given free all-expense trips to Washington after being selected from some 15,000 entrants in a nation-wide contest through rigorous examinations. The 40 young people spent five days in Washington, D. C., dividing their time between a Science Talent Institute, in which they heard addresses by some of the country's leading scientists, and sight-seeing tours around the city, with special emphasis on the museums and research laboratories. Their trips wound up at an interview with Vice President Henry A. Wallace, who had an established reputation in biological research before he entered public life.

The Science Talent Search, which has been going on for the past four months, was made possible through the financial support of the Westinghouse Electric & Manufacturing Company. Joint sponsors are the Science Clubs of America, operating under the auspices of Science Service.

Dr. Harlow Shapley, director of Harvard Observatory, vice president of Science Service, presented the awards of $11,000 in scholarships. Receipt of one of the scholarships does not prevent the winner from accepting other awards that may be made by colleges or universities.

In addition to the two top prizes, eight four-year scholarships, worth $400 each, and 30 one-year scholarships, worth $100 each, were distributed. Thus, every one of the 40 young people who were invited to Washington received some kind of scholarship award.

A man of distinction in science was father to each of the top winners.

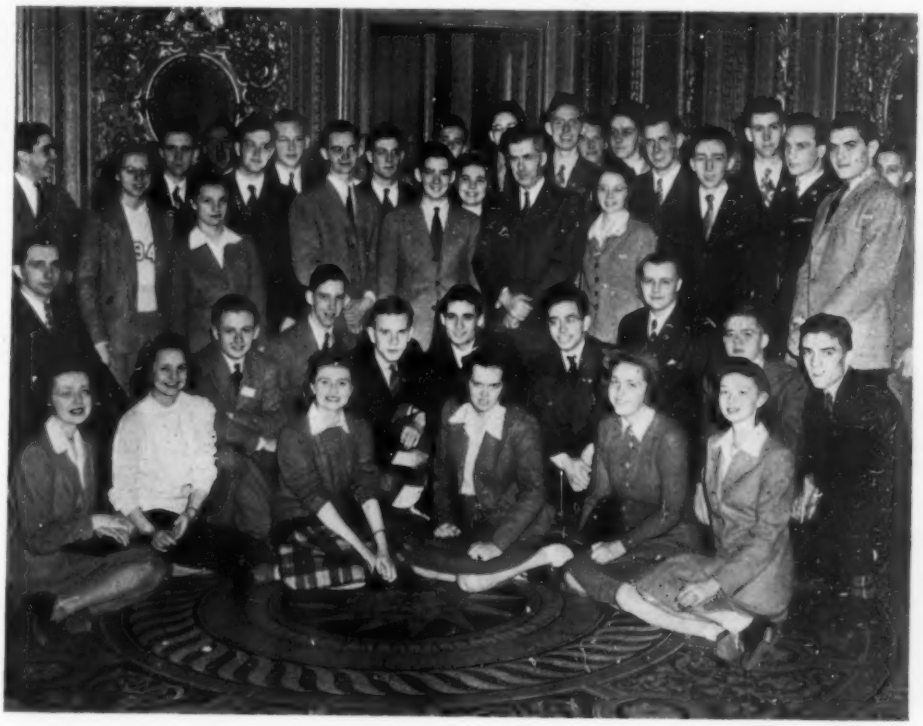
Ray

Ray Schiff is the son of the late Dr. Fritz Schiff, bacteriologist, formerly of the Friedrichshain Hospital, near Berlin, Germany. Dr. Schiff was an expert on blood groups and was the discoverer of a new hereditary characteristic of blood which he called the H factor. He was one of the intellectual refugees from Germany in 1936 and later was head of the Department of Bacteriology of the Beth Israel Hospital in New York.

Ray Schiff, now only 16, stood first in his high school senior class of 250. He has tutored others in mathematics, physics, Latin and English, and last summer served as a counsellor at a boys' camp. He is a member of the National Honor Society. He won first place in an oratorical contest sponsored by the American Legion and won fourth prize in the National League of Nations Examinations. He is an editor of his school paper.

Gloria

Gloria Lauer is the daughter of a psychologist, Prof. Alvhh R. Lauer, of Iowa State College. Prof. Lauer is a member of the American Psychological Association. He has made a special study of the psychology of automobile driving, the analysis of accident proneness, motor coordination, safety and the factors involved in vocational success and teaching and success in academic work.



VISIT TO CAPITOL—The Science Talent Search winners visited the scientist-statesman Vice President Henry A. Wallace. Left to right, seated, front row: Gloria Lauer, Judith Cassidy, Marguerite Killingbeck, Catherine Ens. Second row, seated: Elizabeth Lean, Virginia March, Howard Haftel, Thomas Quermann, Claron Robertson, Joseph Green, Murray Rosenblatt, Wayne Boop, Donald Harris, John Gill. Next row, standing: Robert Palombi, Wanda Wojciechowski, Joan Kunkel, Charles Sargent, Arthur Ortenburger, Jr., Vice President Wallace, Constance Sawyer, Leonard Kurfuerst, William Piper. Back row: Josiah Macy, Jr., Roy Willcockson, (a Representative), Ray Schiff, Donald Penderson, Charles Perot, Robert Folger, Elizabeth Foster, Joseph Fox, Bernard Strehler, Eberhardt Rechtin, Robert Mark, Henry Kohl, Milton Lauenstein, Hillman Dickinson, William Hammerle.











Westinghouse Science Scholarships Winners

GRAND SCHOLARSHIPS OF $2,400
Lauer, Gloria Indus, Ames, Iowa
Schiff, Ray (Reinhart), New Rochelle, N. Y.

ALTERNATES
Lean, Elizabeth Ann, Shorewood, Wis.
Perot, Charles Poultney, IV, Lancaster, Pa.

SCHOLARSHIPS OF $400
Lean, Elizabeth Ann, Shorewood, Wis.
March, Virginia Ellen, Madison, Wis.
Harris, Donald Rosswell, Johnstown, Pa.
Kohl, Henry Hiram, Exeter, N. H.
Macy, Josiah, Jr. Concord, N. H.
Perot, Charles Poultney, IV, Lancaster, Pa.
Piper, William Weidman, Columbus, Ohio
Quermann, Thomas Richard, Clarksburg, W. Va.

ALTERNATES
Kunkel, Joan Lillian, Garden City, N. Y.
1st—Folger, Robert Lancaster, Winter Haven, Fla.
2nd—Peterson, Donald Penhallegon, Geneva, N. Y.

SCHOLARSHIPS OF $100
Cassidy, Judith Mary, Irvington, N. Y.
Ens, Catherine Clara, Dayton, Ohio
Foster, Elizabeth Jane, Oak Park, Ill.
Killingbeck, Marguerite Grace, Nyack, N. Y.
Kunkel, Joan Lillian, Garden City, N. Y.
Ronder, Joan Leslie, New Rochelle, N. Y.
Sawyer, Constance Bragdon, Bethel, Me.
Wojciechowski, Wanda Clara, Bridgeport, Conn.

Boop, Wayne Ellsworth, Matamoras, Pa.
Dickinson, Hillman, Independence, Mo.
Folger, Robert Lancaster, Winter Haven, Fla.
Fox, Joseph Milton, Philadelphia, Pa.
Gill, John Ellis, Las Cruces, N. M.
Green, Joseph M., Los Angeles, Calif.
Haftel, Howard William, Irvington, N. J.
Hammerle, William Gordon, Athens, Ohio
Kurfuerst, Leonard Charles, Philadelphia, Pa.
Lauenstein, Milton Charles, St. Louis, Mo.
McLoughlin, James Gray, Rome, N. Y.
LaLievre, William Boyd, Shaker Heights, Ohio
Mark, Robert Burton, Trenton, N. J.
Ortenburger, Arthur Irving, Norman, Okla.
Palombi, Robert Edmund, Chicago, Ill.
Pederson, Donald Penhallegon, Geneva, N. Y.
Rechtin, Eberhardt, Redondo Beach, Calif.
Robertson, Claron Atherton, Carbondale, Ill.
Rosenblatt, Murray, New York, N. Y.
Sargent, Charles Philip, Lakeville, Conn.
Strehler, Bernard Louis, Johnstown, Pa.
Willcockson, Roy, Tulsa, Okla.

Judges: Dr. Harlow Shapley; Dr. Steuart Henderson Britt; Dr. Harold A. Edgerton.

SCIENCE TALENT INSTITUTE ***—Alternates for the $2,400 scholarship are shown on the top row of the facing picture page: left, Charles Perot and, right, Elizabeth Lean. Center, Dr. Edwin G. Conklin, addressing the Institute. Second row left, Surgeon General Thomas Parran with Gloria Lauer and Ray Schiff. At right is Dr. Hugh S. Taylor, Princeton, with some of the winners. Next row: William Piper, Virginia March, Josiah Macy, Jr. Bottom row: Donald Harris, Thomas Quermann and Henry Kohl.***

Gloria, 17, has assisted her father in some of his safety studies, and plans to study some branch of science in college. Music is, however, a major interest for her. A violinist, she won first place in a state music contest and tied for first place in a music contest sponsored by the Julliard School of Music, New York City. She has played in the Iowa State Symphony orchestra for five years. An artist as well, she won first place in a district American Legion Poppy Poster contest. But some of her talents are very practical; she can operate a simple lathe, drill press, and band saw. In her high school class of 159, she ranks first.

Science News Letter, March 13, 1943

ASTRONOMY

Stars Are International

By DR. HARLOW SHAPLEY
Director of Harvard College Observatory

Address before the Science Talent Institute.

➤ "I AM the little brother of the Sun," said recently a distinguished artist who works in the medium of stained glass windows. He went on to point out that without this cooperation of man and stars, of artist and sunlight, the contribution of stained glass to beauty and to the lift of the human spirit would be of little value.

When you listen to the radio you cooperate with a phenomenon of the natural world. You are working with the electric machinery in the earth's atmosphere. You use the radio roof to bring to you a voice from a great distance. When we utilize the radio we are the children of the ether waves.

The brotherhood of man and stars and atmosphere is interesting but it is not so easily appreciated as the association of man with other men in their efforts to learn about stars and atmospheres, or about plants, rocks, and man himself. I should like to discuss this world wide community of scientific effort, and show that world wide action is the most efficient way to advance in many of our intellectual enterprises.

Let's start with a total eclipse of the sun. Most of you have never seen one. You know, of course, that a total eclipse is one of the most stupendous natural spectacles that man can ever hope to see. But probably you and a total solar eclipse have not been in the same place at the same time. They are indeed so rare, and frequently so hard to get to, that we remain ignorant about many of the features of that remarkable upper atmosphere of the sun, called the corona, which flashes forth for a minute or two when the moon gets exactly between us and the sun and the total eclipse is in operation. It turns out, therefore, that scientists who seek knowledge of this upper atmosphere of the sun in the hope of finding more about its relationship with the earth, generally form international groups. The important narrow path of totality on the earth's surface may fall almost anywhere, without respect to nationality. Frequently most of the path is over the open oceans, or in the Arctic or Antarctic regions; frequently the path of totality crosses inaccessible mountain ranges, or goes through regions disturbingly rich in clouds and rain.

But if the eclipse path is at all accessible the scientists of a dozen countries are likely to be strewn along its path, with their elaborate specialized instruments for the study of the solar corona and other eclipse phenomena.

Astronomers from twenty nations observed the total solar eclipse of 1936 which passed from Southeastern Europe across Russia, Siberia, all the way to Japan and the open Pacific Ocean. Methods of observation were intercompared before the eclipse, and the results intercompared afterwards. Men of half a dozen different nationalities sometimes cooperated in a single eclipse camp.

In recent years there have been important eclipses in Sumatra, Brazil, Canada, Mexico, Peru, and Australia. Each one attracted scientists from many countries and thus helped to emphasize that science is international.

Some years ago a Swiss astronomer, working with American equipment on a total solar eclipse most suitably observed from Western Australia, provided another example of the internationalism of the various sciences. His main job was to make photographs of stars in the vicinity of the sun during the total solar eclipse in order to check the truth of the theory of relativity. The weather, by the way, was good; his very elaborate eclipse camera operated successfully, and the resulting photographs were highly important in establishing the correctness of the theory proposed by Einstein. He checked the deduction that light rays

will be bent when passing by a gravitating body like the sun.

I had feared that clouds would prevent his observations and that the expedition might be a loss. In order to be sure of at least some scientific returns, I prepared and sent to him some instructions about collecting insects in that somewhat unexplored part of the world, and sent him also some bottles of alcohol in which to preserve the specimens he might pick up. He was doubly successful—he captured both the corona on his eclipse plates and some rare ants in the alcohol. But some of the insects were practically identical with those that could be picked up in Asia, Europe, and America. They are cosmopolitan. They too ignore national boundaries.

The point we should make, however, is that when scientists start out to examine and understand the distribution and evolution of beetles, ants, butterflies, and the like, they will fail completely if they do not recognize the world wide significance of similarities and differences in animal forms collected from many continents and islands. All the great museums contain plants and animals from all over the world. The evolution of plants and animals in Darwin's English garden could not have been successfully studied without much knowledge of the animal and plant forms the world over.

We remember, indeed, that Darwin's great contributions to man's comprehension of the biological world was slowly developed by him *after* the famous voyage of the Beagle, which for two years sailed most of the seven seas in one of the famous demonstrations of the necessary internationalism of science and scientific scholarship.

Cooperation Is Simple

But I should return to my stars and tell you of some of the current examples of scientific cooperation. It is my hope that these illustrations, which could be multiplied many fold, will remind you that these stars of ours point out to the wise men of the East and West, of the North and South, that international cooperation is simple, in almost any field of science and probably not too difficult in language, in economics, and in political administration.

Recently the Royal Astronomer of England has made a new and accurate determination of the basic unit of measurement in the universe, that is, a determination of the distance from the earth to the sun. His result, announced a year ago, was based on a special campaign of observations and calculations carried on since 1931 by scientists from all continents, from most of the major countries now at war, from national and private observatories. Without such cooperation this distinguished step in pure science could not have been made. The cooperation was natural, it was easy. Why? Because the sun, stars, and planets are the same to all intelligent men; they are indifferent to trade barriers, to linguistic misunderstandings, to spheres of influence.

Our planet is too small, and our means of communicating with each other in thought, voice, or person, too quick and varied to permit us to be isolated, and insulated from other thinkers and doers. The earth has shrunk in size, relatively, because man's techniques of communication have expanded.

International Right

Occasionally all of you look at the stars. But probably none of you says to himself, "Those stars belong to my nation. Those planets are for my countrymen to investigate." Quite rightly you recognize that scientific exploration of the surrounding universe is an inalienable international right.

For example, some of the stars that in color and temperature are much like our own star, the sun, have been discovered to oscillate in brightness. The studies of these variations are scientifically important because they lead us to knowledge of the structure of stars (like our sun), to knowledge of the structure of the chemical elements (like hydrogen, oxygen, iron) with which we are in continuous association in the day's work. Most important of all, these variable stars guide us to that high adventure of tracing the steps in evolution throughout the universe.

To follow the oscillations of the light, color, temperatures, and motions of these variable stars that are scattered all over the northern and southern skies, requires skillful and continuous work. You may be interested to hear that variable star observation is carried on in all countries of the world, and that much of it is done by amateur scientists—astronomers young and old for whom the watching of the stars is the hobby, the private-time joy and chance to serve in the ranks of those who fight against darkness.

One large and active organization of amateur astronomers has its headquarters at the Harvard Observatory, where we have men who can teach the beginner, directly or by mail. We receive the rough observations and prepare them for publication. We analyze the results, provide star charts, select new objects for observation.

These are not wholly American amateur and professional astronomers in the Variable Star Association. Our reports on the behavior of the stars come from all over the world. Especially active are observers in South Africa, in Australia, in India, Italy, the Argentine, Mexico, and Canada.

Some variable stars in fact could not be well followed, their secrets not learned, if it were not for the wide distribution of observers.

The variable stars have not only promoted a practical international cooperation among the scientists, but they have also helped to break down barriers between professional and amateur. Among the active observers in the Variable Star Association are some of the leading scientists at the greatest of the American observatories; and along with them are inspired "hobby" men and women from many fields. A retired minister, an insurance broker, a famous Arctic explorer, a garage mechanic, many housewives, a bookkeeper, a lawyer, a jeweler, the man who drove the locomotive on the Pittsburgh to Chicago express — these are the types of people who have broken the barriers that surround their ordinary jobs and begun to reach for the stars.

A few weeks ago a nova, or new

"The progress of science has not been based upon a moment's inspiration but has been slowly and carefully built, piece by piece, by patient and tireless investigation. A classic example lies in Edison's search for a suitable filament for the incandescent light bulb.

"Few if any great inventions have been perfected in a 'flash.' New ideas concerning aviation, housing, sources of energy and power, synthetic materials such as plastics and rubber, and a hundred other things must be nurtured until full maturity and practical usefulness is realized.

"In the frame of science is focused the future of mankind, the course of nations, and the destiny of civilization. Unless a balanced program is followed, science could well become the master rather than the benefactor of mankind. It is the task of youth today to accept the responsibility for the progress of science. Youth will accept the challenge!"

—From the essay of Gloria Lauer.

"For progress in any direction, it is necessary to establish a system free from war or the threat of war, and free from tyranny and oppression anywhere. For civilization to advance to its highest peak, that progress must not be hampered by national boundaries which cut the bonds of cooperation, intellectual as well as material. At the end of this war we will have the greatest opportunity in history to organize the world along sound scientific lines which will make possible a just and permanent peace. Our generation thus has before it the most difficult task and the most thrilling challenge ever to face mankind. If we fail, humanity will be doomed; but if we succeed, as we will, we shall usher in an era of prosperity beyond our wildest dreams. For man will conquer nature by conquering himself."—From the essay of Ray Schiff.

star, suddenly appeared in a southern constellation. Its explosive rise to first magnitude glory was followed by a rapid decline. Many kinds of observations were immediately needed. Nova Puppis, as it is called, needed to be watched carefully, and continuously measured as it wavered in light, because analysis of the explosion could much increase our scanty knowledge of exploding stars and their consequence in the general problem of the setup and operation of the stellar universe.

The nova was first reported to us by radiogram from the Argentine. A little later, in a roundabout way, a telegraphic report came in from southern Germany. The new exploding star was independently found also by a cook on a mountain in California, by a keen-eyed observer in southern Canada, although the new star was just barely visible before dawn from his far northern location. It was also discovered by a worker in a New York factory, while he waited for the train to take him to his early morning work.

From the Harvard Observatory we announced telegraphically to as much of the world as we could reach the appearance of the exploding star and within two weeks we had accurate observations from half a dozen countries. The analyzing spectroscopes of the great American observatories closely followed the fading star as it changed from equality with our brightest naked eye stars to invisibility. A month after the discovery was announced there came to us in Cambridge, Massachusetts, numerous photographs and spectrograms of Nova Puppis made by a Greek astronomer in the Orange Free State in South Africa.

How clear it is that the stars are international.

The Northern Lights are studied in the United States, Canada, Russia, Sweden, and especially in Norway. The shooting stars, commonly called meteors, are the friction flashes of dust particles and small rock fragments flowing into our atmosphere from interplanetary space. They certainly are not *national* in any sense. They come, night and day, in all latitudes and longitudes; millions of millions strike the earth every day, although only a fragment are near enough or bright enough or swift enough to be seen, and then mostly at night.

Thus it appears that whether we are charting stars, chasing the solar eclipses, collecting meteors, or recording the variations of stars, sunspots, and Northern Lights, the astronomers are also friendly little brothers of the Sun. We are so readily in cooperation whenever any tough problem comes along that we wonder why all of the children of the ether waves, whatever their national affiliations, cannot overlook the trivialities and rise to the dignity of a world wide manhood.

Science News Letter, March 13, 1943

MEDICINE

Physicians Need to Know How the Viruses Grow

By DR. ELEANOR BLISS

Johns Hopkins School of Medicine

Excerpt from address given before Science Talent Institute.

➤ THE SULFONAMIDES are not effective against animal parasites; nor are they of any use against the viruses —except for two. This is too bad. We can get along with what we have in the way of antiprotozoal drugs but something is needed badly for virus diseases. The drugs are deficient too in respect to bacteria. There are two or three species which are insusceptible. This is trying to the doctor who wants to cure an infection caused by one of the recalcitrants but it adds zest to the study of the drugs. It would be dull if they were perfect. Look at how much more fun physicians are having pointing out the bad effects of the sulfonamides than in describing the cures! Aside from adding spice, however, the fact that there are sulfonamide resistant bacteria is scientifically interesting.

The current concept of the mode of action of the sulfonamides is that they interfere with the action of certain bacterial enzymes—the digestive juices so to speak. So, if a bacterium is resistant, it must mean that it has a different enzyme setup from the other, susceptible, bacteria. I believe that the same hypothesis serves to explain why these drugs are ineffective against animal parasites and viruses—these germs grow by means of mechanisms which are quite different from those by which bacteria grow. If we could find out what that difference is—and we already have a good deal of information about bacterial metabolism—if we could find out how viruses grow, we could perhaps devise a chemical which would be to them what sulfanilamide is to bacteria.

That is a problem which will probably still be waiting for you when you have your PhDs and MDs. If I've made it sound simple don't believe me. It's a honey.

Science News Letter, March 13, 1943

MEDICINE

Cancer Cells Marked By Uncontrolled Growth

By WARREN H. LEWIS

The Wistar Institute of Anatomy and Biology

Excerpt from address made before Science Talent Institute.

➤ THE MOST important characteristic of cancer cells is their uncontrolled growth in the body. All normal cells are subject to rigid control throughout life. The unknown mechanism which keeps normal cells of different types from multiplying beyond their proper limits seems to have no effect on cancer cells. They behave like new species of cells for which there is no control mechanism.

Here at the very beginning we encounter a great fundamental phenomenon, still unsolved, yet this control mechanism extends throughout the entire realm of biology and is of the utmost importance for the understanding of the behavior of cancer cells.

It may be secretions something like the hormones, which have so much control over the reproductive system, are given off by the metabolic activities of many other types of cells and have something to do with the maintenance of the proper size of the various organs and tissues of the body.

Science News Letter, March 13, 1943

CHEMISTRY

Removal of Milk Vitamins Improves Plastic Buttons

➤ SCIENCE, having put vitamins into nearly every conceivable food, has now been asked to take some out.

The milk vitamins in casein, used for plastic "pearl" buttons, made colored buttons instead of the more expensive clear white ones which manufacturers wanted.

Science came to the rescue in the persons of Harold Fick and H. H. Sommer, University of Wisconsin chemists who found that the offending riboflavin could be removed by treating the casein with either warm alcohol or acetone.

It is predicted that this improved clear white plastic may help keep the dairy market from slumping too suddenly when war demands stop.

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GEOLOGY

Ancient Ocean Beds Found to Contain Vanadium

➤ DEVELOPMENT tunnels to tap a jackpot of the war metal, vanadium, are being driven into the canyon walls of Sublette ridge. This formation, running off the southeastern tip of Idaho into Wyoming, is the site of old ocean beds which contain millions of tons of vanadium ore, geologists estimate.

From it comes the light gray metal used as a toughener for armor plate, guns, machine tools and other victory ingredients.

Discovered by the U. S. Geological Survey, the deposits will go far toward making the nation self-sufficient in this war necessity. Up to this time an important part of our vanadium came across submarine-infested sea routes from foreign mines, mainly in Peru. Utilization of the newly found deposits would free much needed shipping space.

More than two years ago phosphate miners in this region began to recover vanadium as a by-product without knowing of the richer beds which lay nearby. But about this time, W. W. Rubey, a Geological Survey geologist searching for phosphate fertilizer, sent in some unimportant-appearing dark shales and mud-stones for analysis. Back came the report on vanadium—a much higher percentage than appeared in the phosphate rock itself.

Then came a tedious period of exploration and sampling. Along a gulch at the foot of Sublette ridge, the searchers came upon the long-abandoned diggings of an old fertilizer prospector. Here a vanadium-rich sample was found which led them to still others. Most of the better analyses seemed to come from one particular bed.

After Pearl Harbor the work was pushed with renewed vigor. Hundreds of old samples were reexamined. With this correlated data, Mr. Rubey again went into the field last spring to test his theory that a single workable vanadium bed of wide extent had been discovered.

Establishing a field laboratory, he took more samples and analyzed them on the spot. Engineers from the Bureau of Mines then came in to cooperate. Finally it was proved that the bed was vanadium-bearing nearly everywhere and its position was carefully mapped.

Results were turned over to the Bureau of Mines, the War Production Board and the Metals Reserve Company for action. Secretary Ickes has banned speculative claim-staking to insure rigorous testing and proper public control of this important war project.

Science News Letter, March 13, 1943

PUBLIC HEALTH

Smallpox Vaccinations Given to 36,000 in D. C.

➤ ABOUT 36,000 residents of Washington, D. C., most of them employees of the federal government, have been vaccinated against smallpox since last December, the District of Columbia Health Department announced. About 10,000 of these vaccinations were given by physicians of the health department and the rest by the medical staffs of various federal and District agencies.

The outbreak of smallpox in nearby Pennsylvania stimulated the current vaccination drive, but Dr. George C. Ruhland, health officer of the District of Columbia, is still urging that all persons living there who have never been vaccinated should take this health protection immediately.

The reason is that Washington is the crossroads of the world in war activities. People are coming not only from the entire nation but from all over the world, many of them from regions where vaccination against smallpox is not practiced, and this increases the danger to unvaccinated persons there.

No case of smallpox has been reported in Washington in the past 10 years.

Science News Letter, March 13, 1943

IN SCIENCE

PHOTOGRAPHY

Snapshooters Told How To Use Ordinary Lights

➤ TO KEEP the amateur photographer from being blacked out by the war, the Eastman Kodak Company has published a chart of exposures for using ordinary house lighting lamps. The government has restricted the sale of flash bulbs, and amateurs are having difficulty obtaining them for pictures indoors. The flood type photographic lighting equipment is becoming hard to obtain because of the metal needed for its manufacture. Pictures can still be taken, however, with home lighting lamps of 60 to 300 watts—the bulb commonly used in the six-way floor lamp.

To take a picture with a box camera, for example, you can use one 100-watt lamp near the camera and a 60-watt lamp at one side with an exposure of one second. Or you can use a 300-watt in combination with a 150-watt for only a fifth of a second.

Science News Letter, March 13, 1943

INVENTION

Simplified Air-Cooling Unit Developed for Post-War Car

➤ A SIMPLIFIED air-cooling unit for that car you are going to get after the war is covered by patent 2,311,224, obtained by Richard E. Gould of Oakwood, Ohio, and assigned to the General Motors Corporation. It gets away from the difficulty of circulating the refrigerant itself through special, hard-to-install coils by keeping the refrigerating medium and all necessary mechanisms within a single, sealed casing. Power is applied through the motor fan belt to a pulley on projecting shaft.

Chilled water is circulated from the unit to cooling coils under the seats or in other convenient places, and air is blown over them by small electric fans. Since the only outlets are for ordinary water tubing, instead of the special tubing required for refrigerant liquid, the inventor claims that any garage mechanic can install and service the unit.

Science News Letter, March 13, 1943

NCE FIELDS

MEDICINE

Vitamin C for Lead Poisoning Called Failure

➤ HOPE that daily doses of ascorbic acid, the synthetic vitamin C, would help prevent lead poisoning among workers exposed to this danger is reduced by a report from Dr. E. E. Evans and Dr. W. D. Norwood, of the medical department of the DuPont dye works, and Dr. R. A. Kehoe and Dr. Willard Machle, of the Kettering Laboratory at the University of Cincinnati College of Medicine (*Journal, American Medical Association,* Feb. 13).

Careful study for one year of a large group of lead workers taking daily doses of the vitamin failed to show any effect on lead concentration in the blood or on lead elimination through body wastes. There was no difference in the physical condition of the men, nor any significant change in red blood cells or hemoglobin.

"No reason has been found," the scientists conclude, "for recommending the use of ascorbic acid to minimize the effects of lead absorption."

Science News Letter, March 13, 1943

RESOURCES

Balsa Wood Production In Costa Rica Boosted

➤ BALSA WOOD yield from Costa Rica will be raised to around 3,000,000 board feet this year through a cooperative project of the Board of Economic Warfare, government officials in Washington believe.

All of this featherweight wood obtainable for war use will be purchased and production further developed. Balsa is being used in large quantities by the United Nations in plane construction, such as the British Mosquito bombers, and in buoyant marine devices, such as life rafts, mine floats and life preservers.

Called a "tree weed," balsa grows wild in the forests and moist lowlands. When 6 to 12 years old, the trees are felled and floated in log rafts to sawmills.

Three new portable sawmills are expected to be in operation along the east coast by next spring. Similar operations may follow in other parts of the country, BEW officials report.

Final operations will be centered at Puerto Limon. The plant will include finishing equipment, warehouses and drying kilns.

Efficient drying of the wood is important since green balsa wood is highly perishable. Kiln-drying facilities are being expanded as rapidly as possible by the Board of Economic Warfare.

Costa Rica has supplied little balsa previously, Ecuador producing 98% of the world's supply. Now, to meet wartime demands, balsa programs are also under way in Colombia, Nicaragua and Guatemala.

Science News Letter, March 13, 1943

PUBLIC HEALTH

War Industries Urged to Save Workers' Eyesight

➤ INDUSTRIAL CONCERNS should give much more attention to workers' eyesight, "not only for humane reasons, but to increase production, to reduce spoilage and to add manpower," Charles P. Tolman, consulting engineer for the National Society for the Prevention of Blindness, declares.

Front-rank companies provide good general safety facilities, but for the most part appear unaware of the importance of eyesight in industry as a managerial responsibility, Mr. Tolman found in a study of 50 typical plants employing 167,000 workers.

At least one-fourth of industrial workers, he estimates, have defective, but correctible, vision. More than three-fourths of the plants studied, moreover, make no effort to determine what visual requirements are necessary or acceptable to qualify a worker for any particular job.

"This means," Mr. Tolman reports, "that these plants do not know how many color-blind or one-eyed men, or men with subnormal but correctible vision can be utilized.

"On the other hand, they may be employing men whose vision is a hazard on the particular job. For example, a man may be working as a crane operator who has deficient 'depth perception,' and so cannot judge the height and placement of the crane load. This would make him a menace to life and property, while if assigned to another job for which his eyesight is suited, he could carry on safely and effectively."

Science News Letter, March 13, 1943

CHEMISTRY

New Alcohol Process For Recovery of Glycerin

➤ A NEW ALCOHOL process for the recovery of glycerin, basis of nitroglycerin, from domestic fats saved by housewives and butchers, has been developed and is now being satisfactorily used commercially by soap manufacturers, du Pont chemists have disclosed.

Recovery of the glycerin by this new method is said to be more economical than by the older processes, and also more complete. Equipment used is smaller and more compact. Iron vessels, instead of the more costly vessels of stainless steel or other alloys, may be used because the reaction is carried on at ordinary temperatures and pressure. And the glycerin produced is water-free.

Because of the critical need of glycerin for making nitroglycerin and dynamite for the use of the Army Engineer Corps, for mining essential metal ores and coal, and for necessary highway construction, any steps that add to the available supply are an aid in the war effort.

Soap manufacturers are permitted to continue to make soap only if they recover the glycerin from the fats for the government's needs in war activities. Cocoanut oil, formerly imported from the Pacific islands and used in large quantities in making soap, is no longer available. For this reason every ounce of animal or other fat not consumed as food must be saved and made available for the explosives based on glycerin.

Science News Letter, March 13, 1943

CHEMISTRY

Nutrition Specialist Receives Pittsburgh Award

FOR OUTSTANDING work in chemistry, Dr. Charles Glenn King, scientific director of the Nutrition Foundation, Inc., was given the Pittsburgh Award of the American Chemical Society's Pittsburgh Section.

Dr. King isolated and identified vitamin C and has done work on enzymes and the chemical structure of fats and sugars.

On leave from the University of Pittsburgh, Dr. King is now visiting professor at Columbia University and scientific director of the Nutrition Foundation to which 16 food companies have subscribed more than a million dollars "for improvement of the diet and health of the American people."

Science News Letter, March 13, 1943

PSYCHIATRY

Shell Shock Common

War conversion hysteria is called most frequent mental casualty in modern warfare. Many could be prevented, psychiatrist says.

➤ SHELL SHOCK is the most common mental casualty in modern warfare, Dr. Edward A. Strecker, professor of psychiatry at the University of Pennsylvania and president-elect of the American Psychiatric Association, declared at the Neuro-Psychiatric Institute meeting at Hartford, Conn.

Many of these mental casualties could be prevented through greater care in the selection of fighting men and through more thorough conditioning for battle of those who are selected, Dr. Strecker, who served as neuropsychiatrist in the U. S. Army in World War I, stated.

"War conversion hysteria, or shell shock," Dr. Strecker explained, "is an abnormal solution of a strong emotional conflict which takes place in the soldier between his ego-instinct (the instinct for self-preservation), which is strongly moved by such emotions as fear, horror and revulsion, and the opposing claims of soldierly ideals and disciplinary reactions.

"In other words, when the conflict within the soldier, which is common among today's combatants, becomes too strong, the soldier responds by a state of shell shock.

"Psychiatry in the armed services, particularly under combat conditions, will have to be 'rough and ready' but skillful," Dr. Strecker continued, adding that this is the acid test of psychiatry today, and that under present world conditions, every physician, in and out of the armed services, will have to practice psychiatry.

Science News Letter, March 13, 1943

FORESTRY

Pine Stumps Salvaged

Formerly left in ground to rot, they are now processed to extract turpentine, rosin and pine oil. Expansion of industry expected.

➤ PINE STUMP salvaging has become a profitable enterprise in southern states where reduction plants have been established to chew them up and extract their turpentine, rosin and pine oil. The plants are working at full speed these days as the war activities use up their products as fast as they can turn them out.

Generally the stumps are left in the ground to rot if the land is to be used for another timber crop. They must be cleared if the land is to be used for farming. Leaving them in the ground or pulling and burning them wastes their valuable resinous and oil contents.

Much experimental work has been done during the past two or three decades by the U. S. Department of Agriculture and by private companies interested in naval stores, to find a profitable method of extracting resinous contents for commercial purposes. Processes have now been simplified and a great expansion in the industry may be expected.

Before the stumps are processed they must be thoroughly dried. Usually they are left in the ground to dry. This may take several years. While drying important changes take place in the composition of their resinous contents. Then they are pulled with special machines, loaded on trucks and taken to the mill. They are washed free of all earth in long troughs through which they are dragged on an endless chain in a stream of running water.

The next step is their mastication. They are ground in drums with heavy cutting blades that crush, cut and chew them into small pieces. In another machine they are further shredded into tiny chips. What was once an ungainly stump is now a mass of very small pieces, and ready for the treatment necessary to extract the oil, the turpentine and rosin.

The extraction is accomplished in large tanks, some of which will hold as much as 15 tons of the chips. The tanks are sealed and the contents treated with a solvent—benzole, naphtha or other petroleum product — which is steam-heated and forced in under pressure. The solvent mixes with the tiny chips and takes up the rosin, turpentine and oil in solution. When the process is completed the liquid is drawn off and the resin-free wood is used for fuel under the boilers of the plant.

The liquid solution is first cooled. A resinous pitch settles which is easily separated. It is sold to foundries where it is used as a core binder. The remaining liquid is separated by distillation. The petroleum solvent is evaporated off first, as it has the lowest boiling point. It is reused. The turpentine is evaporated off next, then the pine oil. The rosin is left in the retort, from which it is drained as a heavy fluid that hardens as it cools.

Longleaf pine and slash pine stumps are used in these processes. There are some nine or ten well-equipped plants operated in the country. The uses of turpentine and rosin are well known. Pine oil is used in the manufacture of textile sizes, disinfectants, liquids and industrial soaps, and in a variety of sprays. It is used also as a flotation agent in recovering metals in copper refining.

Science News Letter, March 13, 1943

CHEMISTRY

By-Product from Beets Used to Make Nazi Forts

➤ THE NAZIS are making cement for fortifications from the by-product of French beet factories, according to a report received indirectly from Germany.

Scum that forms when beets are boiled consists largely of carbonate of lime and water. From this scum, which was formerly thrown away, 4,000 tons of calcium carbonate is said to have been obtained from processing 70,000 tons of beets.

The scum is pumped into large tanks, where it is partially dried. Finely divided clay is then thoroughly mixed with it by mechanical beaters. After burning the mixture in a rotary kiln, the clinker is removed and pulverized into cement.

This new product shows satisfactory durability under war conditions, the report claims.

Science News Letter, March 13, 1943

This is the way to win a battle in the desert

Libya and North Africa made it clearer than ever: THIS IS A WAR OF SUPPLY.

In 1918, an American soldier could be equipped and maintained on 5 tons of supplies each year.

But today, for every soldier sent abroad, *10½ tons* of shipping space must be provided for *equipment alone*. And it takes an additional *18 tons of shipping to supply a single soldier for a year!*

Supply is a matter of *ships*.

And ships need electricity.

Vast quantities of electric power, for a thousand vital tasks that must be done to take a convoy safely across the seas...

Electricity to steer the vessels and operate the radios and signal lights.

Electricity to detect the approach of enemy subs and planes, to sound the alarm, to organize the defense.

Electricity to power great cargo winches, and delicate navigating instruments.

Electricity to make magnetic mines harmless, to provide invisible "black light" for reading charts at night. Electricity to keep food fresh, to cook it, to ventilate the ships, to provide comfort for the crews.

Electricity in every freighter, every tanker, every Navy escort vessel—to help win the war of supply!

We of Westinghouse take tremendous pride in building so much of the electrical equipment, so many of the great turbines and gears and electric drives, for the ships of America's Navy and Merchant Marine.

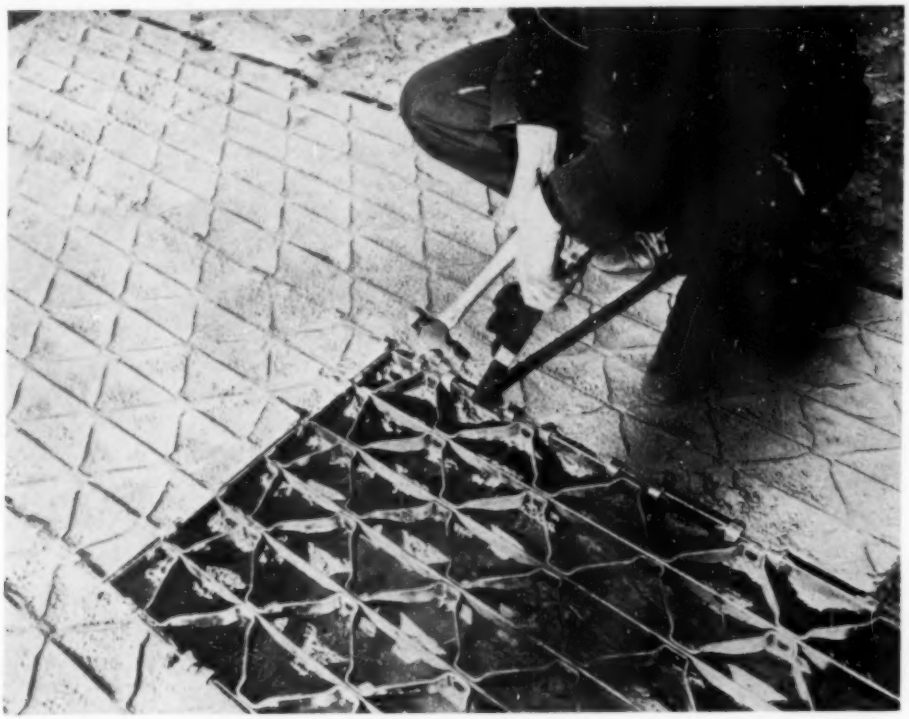
Into every piece of that equipment go all our "know-how," all our skill, all our determination to *do our share* in this war—and if possible, a little more.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pennsylvania.

Tune in the Westinghouse Program starring John Charles Thomas — NBC Network, Sunday, 2:30 P. M., Eastern War Time.

Westinghouse

PLANTS IN 25 CITIES — OFFICES EVERYWHERE



PORTABLE ROADBED—This modern variation of the old dirt road shows post-war promise, especially where a practical roadbed must be quickly laid for temporary use, such as detours. The air forces now use it to make portable emergency landing fields. The steel grating panels are easily connected with hammer and pronged tool. Then sand is filled in between meshes.

PUBLIC HEALTH

Science and the Future

By THOMAS PARRAN, M.D.

Surgeon General, U. S. Public Health Service

Address before the Awards Dinner of Second Annual Science Talent Search, March 2, 1943.

➤ TODAY WE and our Allies are fighting for the four freedoms outlined by our President and confirmed both in the Atlantic Charter and the agreement of the United Nations. They are, you remember: freedom of speech and expression, freedom of worship, freedom from want, and freedom from fear.

In a very real sense, the four freedoms are inherent in the spirit and purpose of science to which you boys and girls have dedicated your futures. Indeed, the interdependence of science and freedom is our hope for the future. Jesus gave us that hope when he said, "Ye shall know the truth and the truth shall make you free."

Without freedom of thought and its expression, science would not exist, and without science, we could not hope for man's ultimate freedom. Since the dawn of history, and probably in prehistoric eras, men have struggled and died for freedom to know the truth, that others might be free.

One of the earliest accomplishments of primitive "scientists" was to free man from the worship of magic and personal gods. Today, there is no freedom of worship in many lands. More subtle, more destructive than physical restraint, is the spiritual enslavement which fastens man's reverence upon the magic of a super-state and causes him to worship false personal gods.

Through science and its application, down through the ages, we have approached the third freedom—freedom of want. We know that now and hereafter, our greatest task will be to implement the third freedom which the President defined as security "to every nation of a healthy peacetime life for its inhabitants." In so doing, we shall secure freedom from fear, for just as science dispels fear of the unknown, so the free peoples will cast out the powers of darkness which have deluded them and ruled them by fear.

Our great immediate task of winning the war, then, needs brains and skills as well as bodies and materials. For that reason, those who have special talents must use them fully in the service of the nation, so that we may do our part to make the world free and to build a better world. You 40 boys and girls who have been selected from hundreds of thousands of high school seniors by the Science Talent Search will soon join that "ancient and honorable company of scholars" upon whose curiosity, and knowledge, and integrity, so much depends.

Perhaps some of you are wondering how it is that science, which is so bound up with the constructive force of freedom, must be directed toward the destructiveness of war. I can appreciate your confusion, for those of us in the life-saving professions have more than once witnessed the imprisonment of the great constructive force of science by man's inhumanity to man. But the first rule of the scientist is to test theory by fact, inspiration by reality. And the reality today is that the enemy is at the door, and if we do not beat him, there will be no freedom for any of us. And so with all the knowledge and skill, strength and courage, at our command, we fight him.

And too, war—with all its destruction—is like a catalyzer that speeds a valuable reaction. Right now, the life-saving sciences are making great strides in defense of our fighting forces and our industrial army. New knowledge is being sought, found, and applied—to heal the wounded, to protect us against such diseases as malaria and typhus fever, to provide an enormous supply of blood plasma, to prevent poisoning from the chemicals and metals used in the war industries. Right now, the newer science of nutrition is advancing into new fields. And it is being applied, now, on a wider scale than ever before—both in this country and wherever the United Nations are fighting.

In other fields, incredible changes have taken place during the past two years. Whole new industries have sprung to giant size—for the immediate purpose of winning the war, but they present a vision of future accomplishment for peaceful purposes that is truly dazzling. A new air age is envisioned; the plastics industry promises almost miraculous changes in our ways of living; new methods have been developed which cut

the time needed to manufacture a product tremendously. In addition, we have more machine tools, more metal refineries, and more electric power than ever before. True, these enormous physical resources, along with all our manpower and womanpower, are now devoted to the task of winning the war. But after the war is won, they can be turned into a powerful constructive force. And our scientists must tell us how to use this great industrial machine for the health and happiness of the world.

Meanwhile, on the health front, research of a fundamental and practical sort must continue if we are to improve and keep our ascendancy over the diseases that we know how to control, and to bring under subjection diseases that are still our major plagues. Many of the great plagues of human history are no longer in the headlines, despite the disturbed state of the warring world. We may thank the successful application of science for the fact that such diseases as diphtheria, cholera, typhoid fever, and smallpox have so far receded that we can, *and are,* keeping them down, through control methods tried and true. We may thank science for the methods now being directed toward the control of syphilis, gonorrhea, typhus fever, and yellow fever—methods worked out laboriously, and with great cost and sacrifice in the years past.

Still, much remains to be done by our scientists *now,* and in the future by you and your colleagues. Cancer remains one of the great medical mysteries, for which neither cause, prevention, nor certain cure is known. More knowledge is needed with respect to human nutrition, the feeding of domestic animals, and the production of food. And the very industrial developments which promise so much for better living, offer threats to the lives of the workers in the form of poisonous substances and hazardous processes. Constant research is needed in this field, and is going on now. Few of us realize that before we can produce synthetic rubber successfully, we must learn how to protect the workers from the chemicals used. Few realize that the new speeds and heights of air transport require protection of pilot, crew, and passengers from the effects of high altitude flying.

And, in the application of knowledge already gained, the health professions need more trained people for the eternal vigilance war demands. We can expect plagues to rise again—not necessarily new diseases, but old plagues new in violence, spreading rapidly due to the changing conditions in the upset world. The abilities of those who are to prepare for a medical or public health career, particularly those of you who have the rare gift of creative inquiry, will be needed as never before in keeping the free world healthy.

All of our health problems are not concerned with enemy bombs and bullets, disease germs, or even ordinary sanitation, with which we struggle in peace as in war. In that connection, I want to tell you a story I heard at a conference sponsored by the Public Health Service the other day in New York.

It is the story of a sailor in the British merchant marine, but it could be the the story of any of the brave men who are facing constant danger, day and night, to carry food, ammunition, and other supplies overseas. This man had been at sea for two and a half years without a vacation. He had been through many bad enemy attacks. One of his ships had been torpedoed. He had seen other ships and other men lost, time after time. But he did not crack up.

On his last voyage, there were many delays in getting the ship loaded; ship's stores had been removed before she

sailed; she ran aground in the harbor; the refrigeration broke down while the ship was in the tropics; food ran low—a whole series of irritations. Our seaman began to have symptoms of stomach ulcer.

Then, one night while supervising the loading of the ship in New York harbor, he collapsed with terrific abdominal pain. He was rushed to the hospital, where the doctors made a thorough examination, but could find no symptoms of stomach ulcer or any other so-called physical disease. Yet, he was a sick man, and in real pain. After two weeks, he was better and was discharged as physically sound. They told him to "rest up for his nerves" and turned him loose to wander around New York. His board and lodging were paid; he was entertained at canteens and given free theater tickets; but he hadn't a nickel for subway fare or cigarettes. He was despondent and knew he wasn't well, in spite of the clean bill of health from the hospital.

Finally, he came to the attention of a psychiatrist, a doctor who understands mental distress as well as physical illness. After talking for a few minutes about his immediate worries, the seaman suddenly came out with a terrific blast against his last skipper, and for ten minutes poured out a mass of hostile talk against the skipper, who, he felt, was incompetent, dishonest, and with no regard for the men serving under him.

That man's story showed the psychiatrist a number of things, chief among them that healthy men and women cannot stand danger, fatigue, strains of many kinds, indefinitely and without relief, and not do some damage to body and spirit—and hence to the very cause we all serve. The man's underlying resentment against his boss showed the psychiatrist, too, that a healthy man can fight on against overwhelming odds and not crack up unless he feels a sense of injustice, in this case that the boss was not looking after the men properly. This story showed the psychiatrist a fundamental cause of "war nerves," a condition which many healthy men and women will suffer before the war is over; a condition of which no one need be afraid or ashamed; a condition which can be prevented and cured.

The story showed me something more: the importance of good leadership to high morale—or mental health, if you like. Good leadership—a boss who is competent and interested in the men and women on the job with him—is just as important to the war worker as protection against poisonous fumes. For there is no more dangerous poison than resentment. Good leadership is just as important to the health of the fighting man as protection against malaria or typhus fever. For there is no more virulent disease than hidden hate.

The theme of this Science Talent Institute is science and the future. You boys and girls will be spending the next years learning technical proficiency in various branches of science, learning to contribute to the world's knowledge through new discoveries in your chosen fields. I hope that many of you will join us in the fight for human health and happiness. We shall need you, and thousands more of your generation—in the laboratory, in the hospital, in the field, and most of all in the troubled hearts of men and women everywhere. The youth of the entire United Nations will be needed to bind up the wounds, heal the sickness, and feed the starved bodies of the millions in Europe and Asia, and around the globe. They will look to you and your co-workers among our Allies for succor. Doctors, dentists, nurses, technicians, research scientists, experts in many fields will be needed in untold numbers. This is no idle dream. The way is being prepared for you. Some of our young scientists from the Public Health Service with specialists from other organizations are already forming Health Expeditionary Forces, whose first task will be to control epidemic diseases and feed the starving in liberated areas.

There is that other kind of pestilence which I have touched upon and which may spring up in many lands when the figting is over. That is, the mental distress, even serious mental illness, arising from years of hatred, unsatisfied desires, repressed and conflicting emotions. Resentment and despondency will surely be widespread in the defeated and conquered nations—feelings inspired by disillusionment in leaders who have let the people down so often and so badly, even abandoning them with no regard to their fate. This may seem too gloomy a picture. But let me remind you that now, and in the future, everlastingly, we have working with us a force stronger than hate. A force, which if coupled with the energy now so destructively released in aggression, will indeed make the world free. This constructive force goes by many names, frowned upon, I regret to say, by some scientists as not being subject to proof. It is brotherhood, charity, love—the force for good in each of us. We have not yet used this force as we should; nor have we yet been able to put "love" in a test-tube. In fact, we have been so busy harnessing our environment that we have learned relatively little about man himself.

Here then, is a challenge to science and the future. A challenge to you and the future. Some of you may have read or seen Sherwood Anderson's fine play, "There Shall Be No Night." If any of you boys and girls have entertained a doubt that there is no longer room for the pioneer in science, these words should still it. The central character of the play says:

"You have heard it said that the days of exploration are over—that there are no more lost continents, no more Eldorados. But I promise you that the greatest of all adventures in exploration is still before us—the exploration of man himself—his mind—his spirit—the thing we call his character—the quality which has raised him above the beasts. 'Know thyself', said the oracle. After thousands of years, we still don't know. Can we learn before it is too late?"

You see, we need you and thousands like you, for the world we build will be your world and your children's. Science needs not only the talent and the skill to acquire new knowledge, but the spirit and the faith to apply knowledge for the welfare of men, women, and children everywhere.

Among countless millions, there is today a growing sense of fellowship, a growing will to have done with destruction, and to release instead mankind's capacity for peace. This underlying faith stems from the sure knowledge that practical application of science can be used with the same revolutionary effects in *saving* life as it has been used to destroy. We have only begun to glimpse the future's promise; I know that these young men and women, armed with the disciplined freedom of science, will help fulfill it.

Science News Letter, March 13, 1943

BOTANY

NATURE RAMBLINGS by Frank Thone

Disputed Symbol

➤ HOW WELL the shamrock symbolizes the story of St. Patrick!

We know quite surely that there was a great bishop named Patrick in Ireland, in the first half of the fifth century A.D., but we know almost no details about his life and work.

Similarly, we know quite surely that the ancient Irish loved and honored a plant called the shamrock, and had a legend connecting it with their saint—but we do not know at all surely what the shamrock was.

The confusion arises largely out of the very name itself. The old Gaelic word which is transliterated into the modern Latin alphabet as "seamrog" and pronounced "shamrock" means simply trefoil or three-leaf. It might refer to any three-leaved plant; and it has been applied to at least three plant species common in Ireland. One of these is the common white clover; another is the so-called black clover, which has yellow flowers; the third is a three-leaved plant not at all related to the clovers, the oxalis or wood sorrel. Several other claimants have their champions, too.

According to Bailey's Cyclopedia of Horticulture, at the time of Spenser's *Faerie Queene* shamrock was said to be good to eat. That would appear to score one for the oxalis, for it is edible (in small quantities) whereas the clovers are not tempting to the human palate. However, Spenser lived more than a thousand years after the time of St. Patrick, so that doesn't really settle anything.

Indeed, it hardly settles what plant was considered to be the shamrock in Spenser's time, let alone St. Patrick's. For there are those who claim that the real shamrock is the watercress, which certainly is used for food to a far greater extent than the oxalis.

It seems rather unlikely, after all these centuries, that the argument will ever be settled.

Science News Letter, March 13, 1943

AERONAUTICS

Present and Future Of Aeronautics

By DR. HUGH L. DRYDEN

President, Institute of the Aeronautical Sciences, and Physicist, National Bureau of Standards

Excerpt from an address before the Science Talent Institute.

➤ WHO CAN foresee the future development of aeronautics? The future depends greatly on continued scientific research and development, not only in the direct fields of aeronautics but also in the basic aeronautical sciences. An improvement in airplane design is often based on development undertaken and carried through without reference to possible aeronautical applications. Thus a new advance in metallurgy or in electrical engineering made for quite other purposes may find application in aeronautical design. Some idea of the broad base underlying aeronautical development may be obtained from the wide range of interests of the Institute of Aeronautical Sciences including aero-dynamics, heat transfer, chemistry of fuels, metallurgy, and medicine, as well as more specifically engineering sciences of structural design, airplane performance and airplane production.

Research facilities have been greatly expanded both through the action of Congress in increasing the facilities of the National Advisory Committee for Aeronautics and through the action of industry in increasing their own facilities. Recent announcement was made of two industry-operated wind tunnels for studying aerodynamic problems at speeds up to 700 miles per hour, the cost of each being about $2,100,000. Details of the new Government facilities have not been announced. Tools such as these enable scientists and engineers to study safely in the laboratory the performance of new designs at high speeds.

The skill and ingenuity of individual research workers are still the most important factors in determining the future. I hope that some of you present will be interested in the aeronautical sciences and become important elements in determining the future of aeronautics.

Science News Letter, March 13, 1943

• New Machines and Gadgets •

❁ *UNBREAKABLE watch crystals are being made from the same transparent plastic used on plane noses, gun turrets and navigation blisters. They are sealed in place, making the timepieces dust and waterproof.*

Science News Letter, March 13, 1943

❁ *A MICRO-SCALE with which the toolmaker can see the fine divisions of the scale magnified about four times, will be a useful instrument for workers who have to do close work. An unbreakable plastic lens slides along the scale when it is in use, and folds with the scale so that it can be carried in the pocket.*

Science News Letter, March 13, 1943

❁ *THE PRESSURE transmitter is a new gauge used in aircraft to indicate to the pilot the pressure on fuel and oil lines at the engines. The instrument, weighing only 15 ounces, is constructed with two chambers separated by a synthetic rubber diaphragm through which the pressure of the combustible fuel is transmitted to a low viscosity liquid and to the indicator in the cockpit.*

Science News Letter, March 13, 1943

❁ *BY USING a bottom-pour electrically heated furnace, solder drosses are being remelted to reclaim their tin content, as shown in the picture. A sizable amount of this irreplaceable metal is thus obtained.*

Science News Letter, March 13, 1943

❁ *A PHOTOGRAPHIC device to take split-second photographs of liquid spray has been developed, and may be used to make the automobile engine more efficient by measuring the fineness of the droplets in the carburetor. Pictures are taken with it in 10 millionths of a second by means of a high-intensity electric spark from a 5,500-volt spark gap.*

Science News Letter, March 13, 1943

❁ *CAMOUFLAGE colors are being standardized with an electronic device that distinguishes 2,000,000 different colors.*

Science News Letter, March 13, 1943

❁ *A SMALL animal exterminator to kill rats, mice, weasels and other pests has just been patented. It causes painless death by electric shock.*

Science News Letter, March 13, 1943

❁ *AN IMPROVED motor-driven toothbrush has just been patented. The brush unit is removable and can be replaced when worn out. Proper brushing is promoted by relating direction of brush rotation to the position in which the device is held. A guard regulates the distribution of tooth paste over the brush and protects the tissues of the mouth.*

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If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 147.*

• Just Off the Press •

AIR NAVIGATION—Herbert S. Zim—*Harcourt, Brace,* 324 p., illus., $3.

AMERICAN PLANNING AND CIVIC ANNUAL—Edited by Harlean James—*American Planning and Civic Ass'n.,* 254 p., $3. "A record of recent civic advance in the fields of planning, parks, housing, and neighborhood improvement."

A.S.T.M. STANDARDS ON PAINT, VARNISH, LACQUER, AND RELATED PRODUCTS—Prepared by Committee D-1 on Paint, Varnish, Lacquer, and Related Products—*American Society for Testing Materials,* 410 p., illus., 1 to 9 copies, $2.25 per copy; 10 to 49, $1.75 each. Specifications, Methods of Testing, Definitions of Terms.

THE BIRDS OF CAPE PRINCE OF WALES, ALASKA — Alfred M. Bailey — *Colorado Museum of Natural History*—113 p., illus., 50c. (Proceedings of the Colorado Museum of Natural History, Volume XVIII, No. 1)

BOOM COPPER: The Story of the First U. S. Mining Boom — Angus Murdoch — *Macmillan,* 255 p., illus., $3.

THE CHEMISTRY OF NATURAL COLORING MATTERS: The Constitutions, Properties, and Biological Relations of the Important Natural Pigments—Fritz Mayer, translated and revised by A. H. Cook—*Reinhold,* 354 p., illus., $10.

FISHES OF THE PHOENIX AND SAMOAN ISLANDS COLLECTED IN 1939 DURING THE EXPEDITION OF THE U. S. S. "BUSHNELL"—Leonard P. Schultz—*Govt. Print. Off.,* 316 p., illus., 65c.

FOOD POISONING—G. M. Dack—*Univ. of Chicago Press,* 138 p., $2.

FUNDAMENTAL PRINCIPLES OF BACTERIOLOGY—A. J. Salle—*McGraw-Hill,* 643 p., illus., $4. 2d edition.

GERMANY'S MASTER PLAN: The Story of Industrial Offensive—Joseph Borkin and Charles A. Welsh — *Duell, Sloan and Pearce,* 339 p., $2.50.

GUIDE TO THE APPALACHIAN TRAIL IN THE SOUTHERN APPALACHIANS — *The Appalachian Trail Conference,* 437 p., maps, $1.75, map cases 75c. 2d edition. (Publication No. 8)

MANUAL FOR OBSERVATIONAL AND PRACTICAL LABORATORY WORK IN ELEMENTARY ASTRONOMY—Oscar Lee Dustheimer—for sale by author, Altoona, Pa., 100 p., illus., $1.25 students, $1 teachers.

MANUAL OF DERMATOLOGY—Donald M. Pillsbury, Marior B. Sulzberger, Clarence S. Livingood—*W. B. Saunders Co.,* 421 p., illus., $2.

MARINE ENGINE AND FIRE ROOM GUIDE—Robert H. Jacobs and E. L. Cady—*Cornell Maritime Press,* 729 p., illus., $3.50.

THE OBSERVER'S BOOK ON METEOROLOGY—William Alexander and W. J. D. Allan—*Chemical Publ. Co.,* 110 p., illus., $1.50.

THE OREGON FIBER-FLAX INDUSTRY: With Particular Reference to Marketing—Edward L. Rada and D. B. DeLoach—*Oregon State College,* 86 p., 50c.

THE RING-NECK SNAKES, GENUS DIADOPHIS—Frank Nelson Blanchard—*Chicago Academy of Sciences,* 144 p., $1.25. (Bulletin of the Chicago Academy of Sciences, Vol. 7, No. 1)

SERVICES TO THE ORTHOPEDICALLY HANDICAPPED—Louis P. Hoyer and Charles K. Hay—*The Trustees of the Widner Memorial School for Crippled Children and the Board of Public Education School District of Philadelphia,* 115 p., illus., 50c., in lots of 10 or more, 40c.

THE SIGHT SAVER—C. J. Gerling—*Harvest House,* 202 p., $2. Information, alphabetically arranged in dictionary style, on eyes, eyesight, eyeglasses and kindred topics.

SOCIAL WORK YEAR BOOK 1943: A Description of Organized Activities in Social Work and in Related Fields—Russell H. Kurtz, ed.—*Russell Sage Foundation,* seventh issue, 764 p., $3.25. In two parts. Part II is "a directory of 1110 national and state agencies in social work and related fields."

A SURGEON'S FIGHT TO REBUILD MEN: An Autobiography—Fred H. Albee—*Dutton,* 349 p., illus., $3.50.

VICTORY VITAMIN COOK BOOK: For Wartime Meals—Florence Laganke Harris—*Penn Pub. Corp.,* 185 p., $1.50.